

	L #	Hits	Search Text
1	L2	1	(name id indentifier) with (subset subgroup set group list table) adj3 address and (domane adj name dns) and select\$4 adj5 (router path) with (criteria condition status qos)
2	L1	67	(name id indentifier) with (subset subgroup set group list table) adj3 address and (domane adj name dns) and select\$4 adj5 (router path)
3	L3	58	(name id indentifier) with (subset subgroup set group list table) adj3 address and (domaine adj name dns) and select\$4 adj3 (router path routing)
4	L4	12	(name id indentifier) with (subset subgroup set group list table) adj3 address and (domaine adj name dns) and select\$4 adj3 (address\$3 router path routing).ab.
5	L5	592	(domaine adj name dns) and select\$4 adj3 (address\$3 router path routing) with (predetermin\$3 predefin\$3 preset preconfigur\$5 meet based accord\$3 correspon\$4 relat\$4 relationship)
6	L6	31987	"709"/\$\$\$
7	L7	84	5 and 6
8	L8	31	(domaine adj name dns) and select\$4 adj3 (address\$3 router path routing) with (predetermin\$3 predefin\$3 preset preconfigur\$5 meet based accord\$3 correspon\$4 relat\$4 relationship).ab.
9	L9	78	crosson.inv.
10	L10	6071	(hp hewllett adj packard).as.
11	L11	0	9 and 10
12	L12	0	6 and (9 10)
13	L13	4	(domaine adj name dns) and (9 10)



US006336138B1

(12) **United States Patent**
Caswell et al.

(10) **Patent No.:** **US 6,336,138 B1**
(45) **Date of Patent:** **Jan. 1, 2002**

(54) **TEMPLATE-DRIVEN APPROACH FOR
GENERATING MODELS ON NETWORK
SERVICES**

(75) **Inventors:** **Deborah L. Caswell**, Santa Clara;
Srinivas Ramanathan, Sunnyvale, both
of CA (US); **James D. Hunter**, Fort
Collins, CO (US); **Scott S. Neal**, Fort
Collins, CO (US); **Frederick A. Sieker**,
Fort Collins, CO (US); **Mark D. Smith**,
Fort Collins, CO (US)

(73) **Assignee:** **Hewlett-Packard Company**, Palo Alto,
CA (US)

(*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** **09/139,959**

(22) **Filed:** **Aug. 25, 1998**

(51) **Int. Cl.⁷** **G06F 15/173; G06F 15/15**

(52) **U.S. Cl.** **709/223; 709/224; 709/226;**
345/440; 370/229

(58) **Field of Search** **709/224, 223,**
709/225, 226, 245, 218; 345/440, 449;
370/229, 254

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,185,860 A	2/1993	Wu	395/200
5,276,789 A	1/1994	Besaw et al.	395/140
5,455,853 A *	10/1995	Cebulka et al.	379/201
5,778,049 A *	7/1998	Young et al.	379/10
5,796,951 A *	8/1998	Hamner et al.	709/223

6,076,106 A *	6/2000	Hamner et al.	709/223
6,138,122 A *	10/2000	Smith et al.	707/103
6,182,136 B1 *	1/2001	Ramanathan et al.	709/224

* cited by examiner

Primary Examiner—Glenton B. Burgess

Assistant Examiner—Abdullahi E. Salad

(57) **ABSTRACT**

A method and system of modeling a selected service within a network environment includes forming a service model template that is not specific to the network environment, but identifies anticipated network elements and network services that cooperate to enable the selected service. The service model template includes specifications related to linking the anticipated network elements and network services. When the service model template is combined with discovered instance information that is specific to actual network elements and actual network services, a service model instance is generated for the selected service. The service model instance includes identifications of dependencies among the elements and services. Preferably, the service model instance also includes identification of the "health" of the different elements and services. A view generator may be used to configure the service model instance as a hierarchical graph of nodes that are linked to identify the dependencies among the nodes. The discovered instance information may be acquired using a discovery template that orchestrates the process. The discovery template may identify auto-discovery modules that are to be used to detect actual network elements and services and may identify dependencies among the modules. A user-configurable discovery engine accesses the discovery template and deploys the modules in order to acquire the discovered instance information.

15 Claims, 12 Drawing Sheets

